Space Weather Forecast

Issued on Wednesday 13 November 2024 at 01:24 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor./Moderate radio blackouts (R1/R2) likely throughout. Chance of Active to G1/Minor Geomagnetic Storm intervals, mainly Day 1 (13 Nov).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has remained at Low levels over the past 24 hours, with occasional mid-ranking Common-class flares observed. Many of the flares have emanated from the largest and most complex sunspot region near the middle of the Sun. The peak flare however, came from a region just beyond the northwest limb.

There are currently seven sunspot regions on the facing side, with the aforementioned region dominating in terms of size complexity. All of the spots are contained in the southern hemisphere. One other notable region, close to the western limb, has declined in size and complexity over the past 24-hours.

An impulsive filament eruption was ongoing at the start of 12 Nov, with a subsequent, and more significant filament eruption around 12/1400 UTC. Both of which are considered to be travelling away from Earth and are expected to miss.

As such, no Coronal Mass Ejections (CMEs) observed over the past 24-hours are considered to have an Earth-directed component.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of a slow regime. The solar wind speed fell from initial values of around 400 km/s to 340km/s. The number of particles and their associated magnetic field were both unremarkable in being small-scale and stable. The important north-south component has been erratic and mostly southward oriented.

The net result of the above solar wind measures was for Quiet (Kp 1-2) geomagnetic activity throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Isolated Moderate-class flares are likely, with a slight chance of Strong-class flares, most likely from the complex central sunspot.

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Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast.

Connection to a stream of fast winds from a coronal hole is expected during Day 1 (13 Nov) with enhancement to wind speeds expected to then persist for much of the period, peak speeds of 450-500 km/s. Largely Quiet to Unsettled (Kp 0-3) geomagnetic activity forecast, with chance of Active to G1/Minor Geomagnetic Storm intervals (Kp 4-5), mainly on Day 1, as a result of coronal hole influence.

Energetic Particles / Solar Radiation: High energy proton flux is expected to remain at background levels with Solar Radiation storms not expected. There is a very slight rising trend in the probability of S1/Minor solar radiation storms, mainly due to the potential for significant flares from the largest sunspot group as it rotates into a potentially more geoeffective position in the western solar hemisphere.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	70	70	70	70
Very Active	R3-R5 (X Class)	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	15	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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